TOSTTO" T9609260

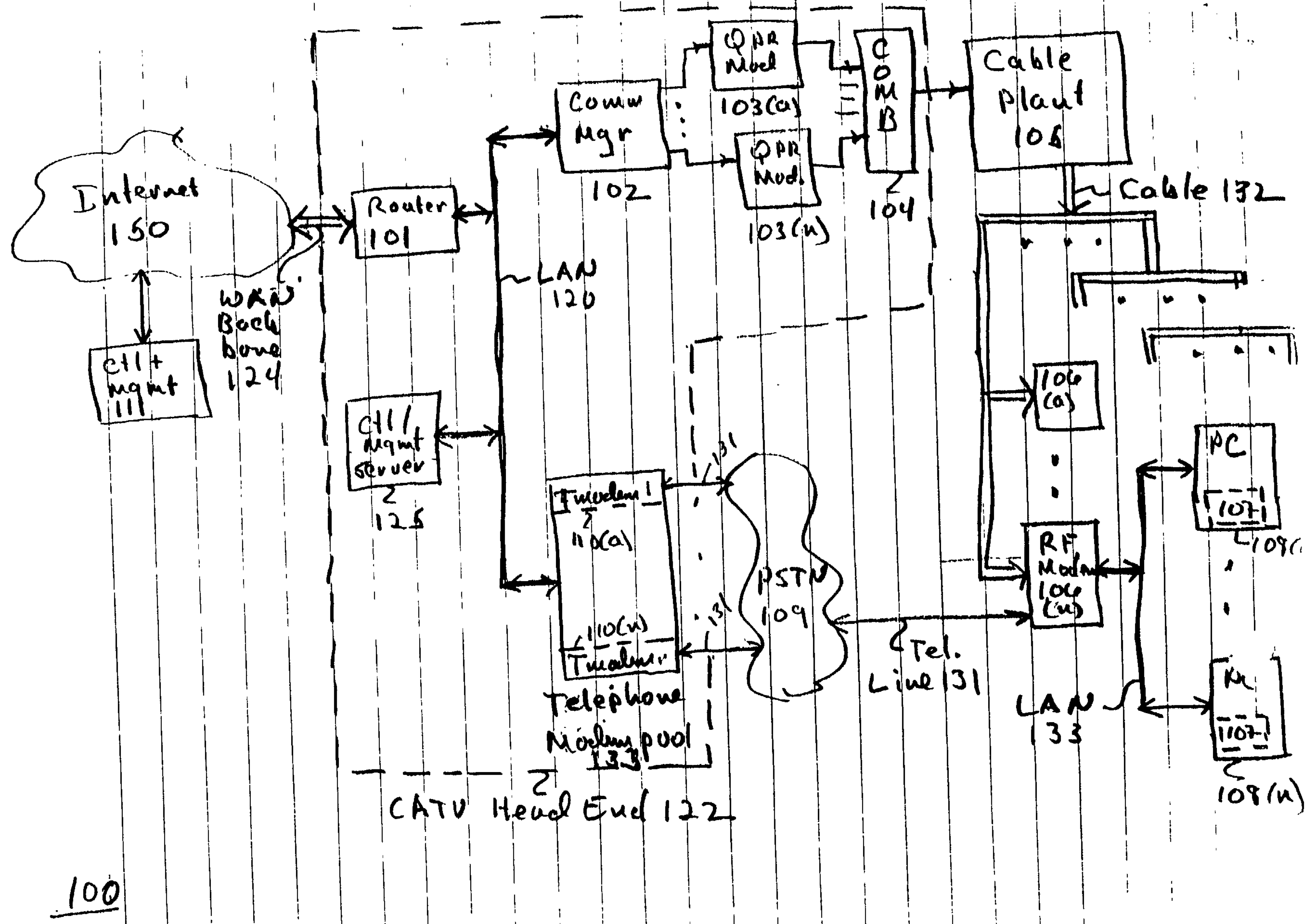
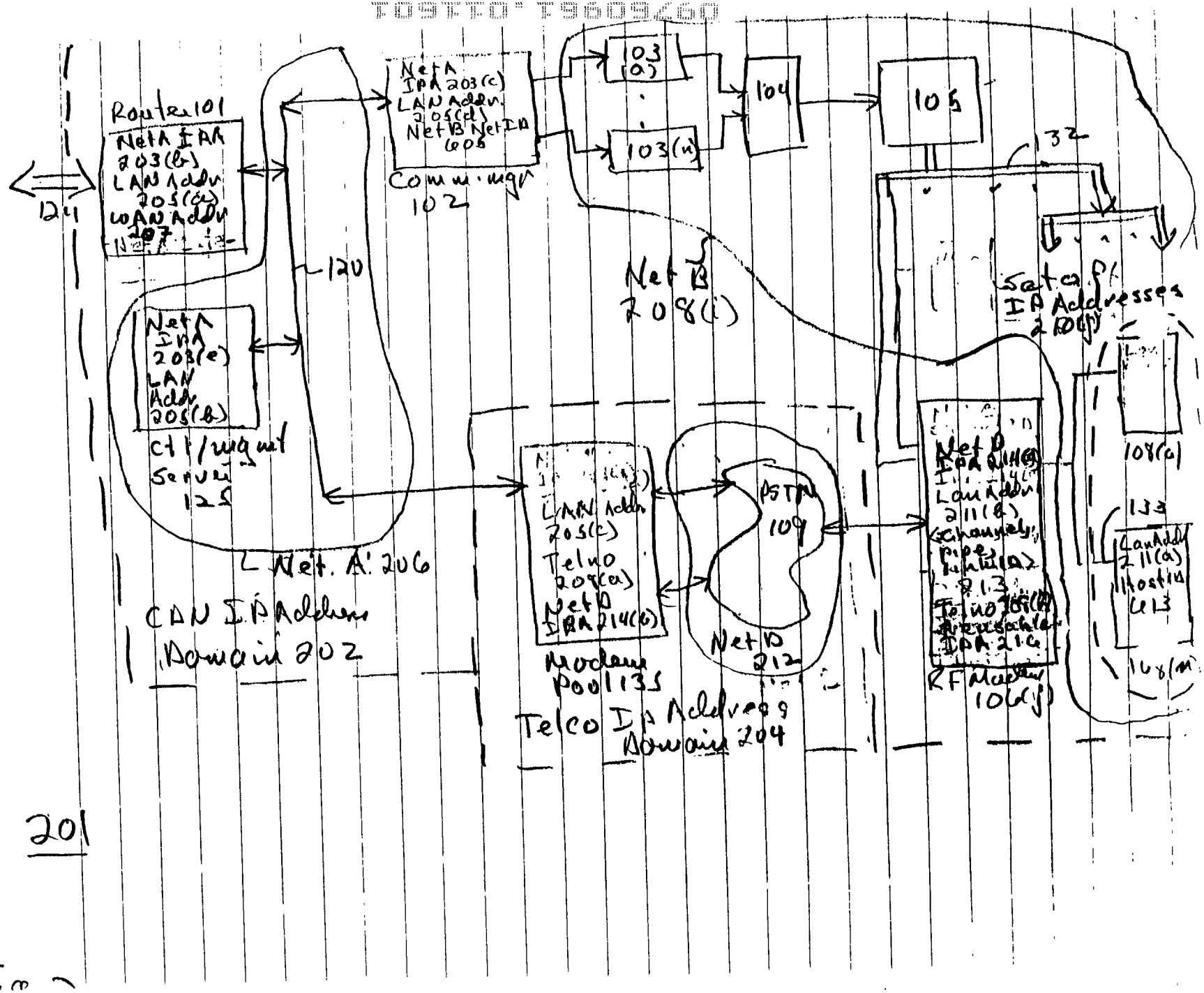


Fig 1

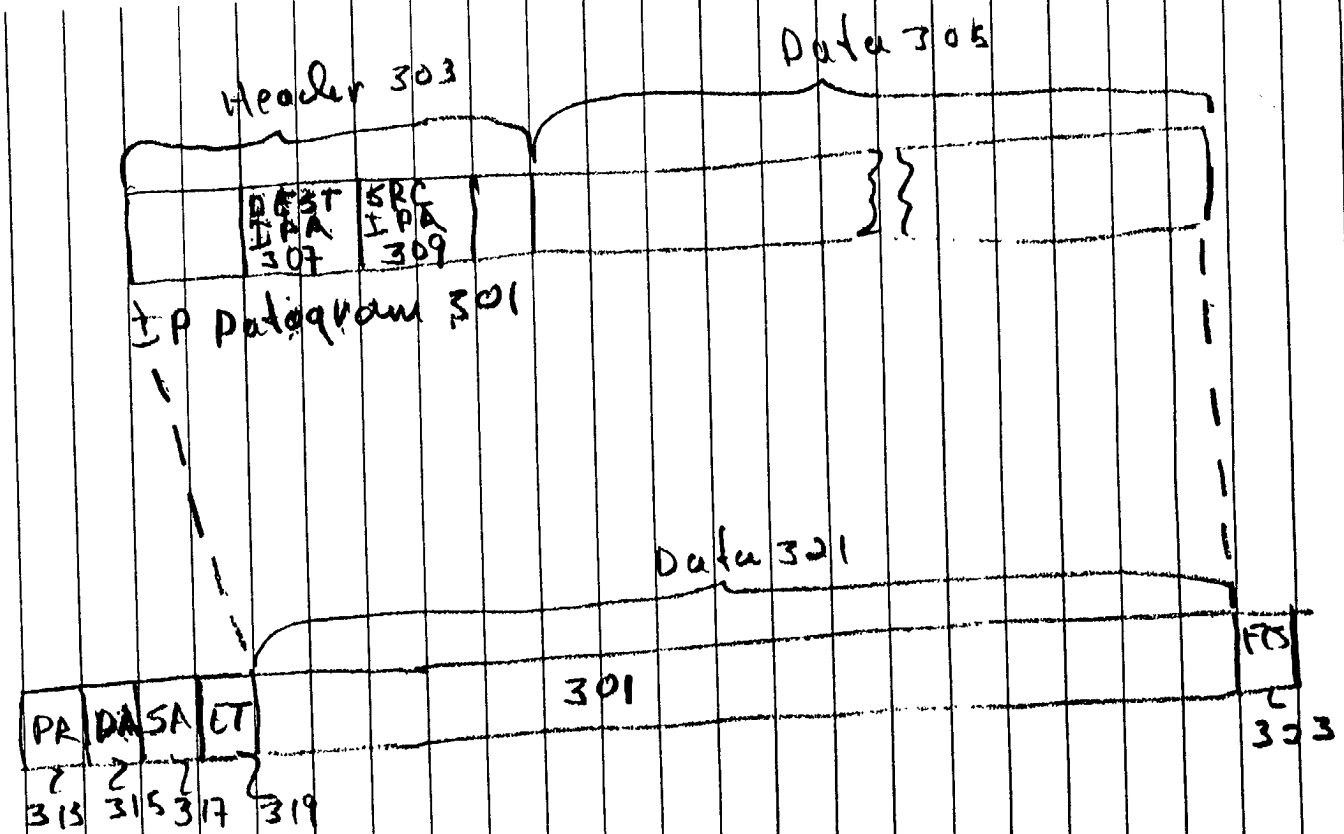
TOSTEO "T9609600



201

Fig. 2

T09T10 T3609260



Ethernet Frame 311
with IP Datagram as Data

Fig. 3

T09710 T96092650

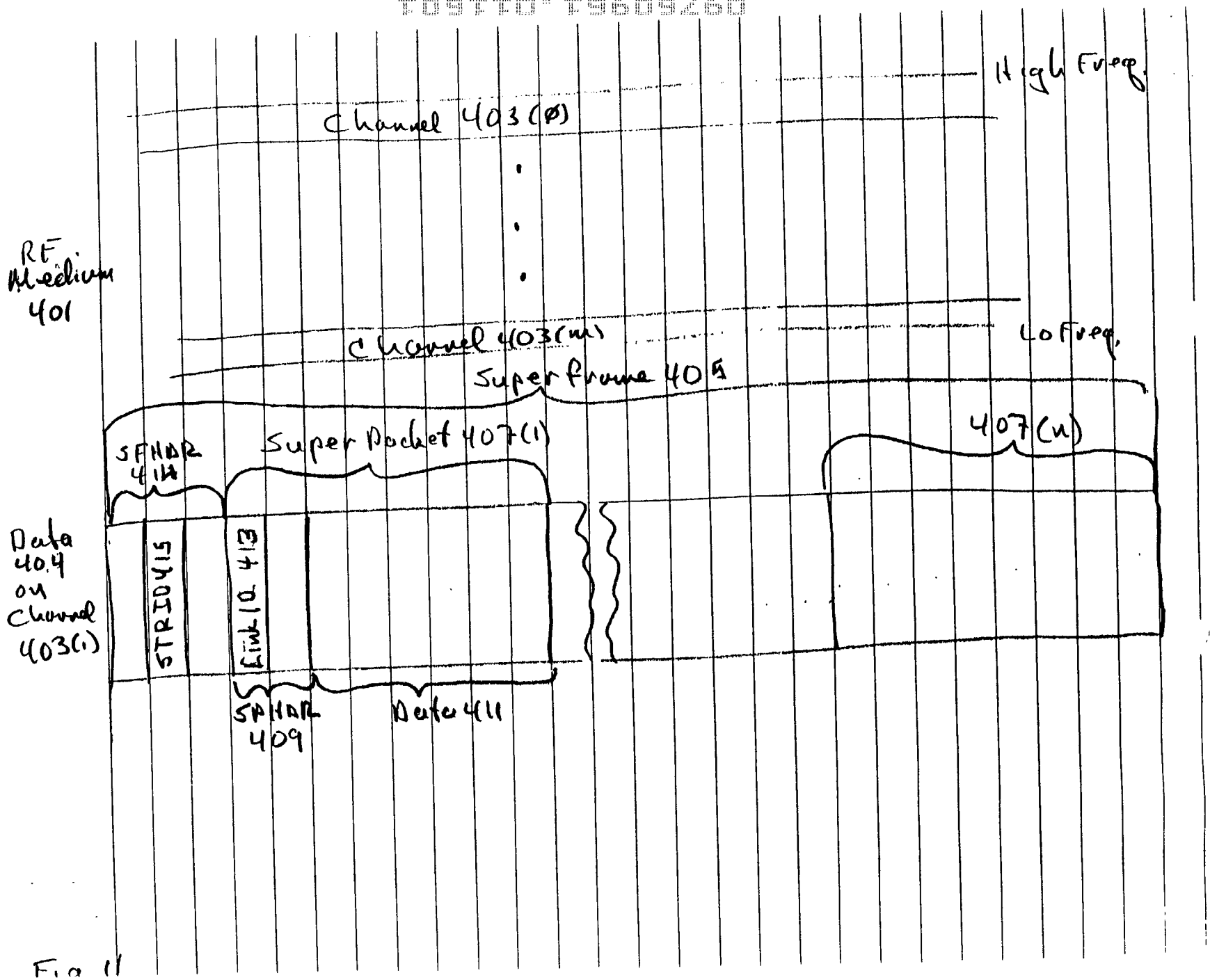


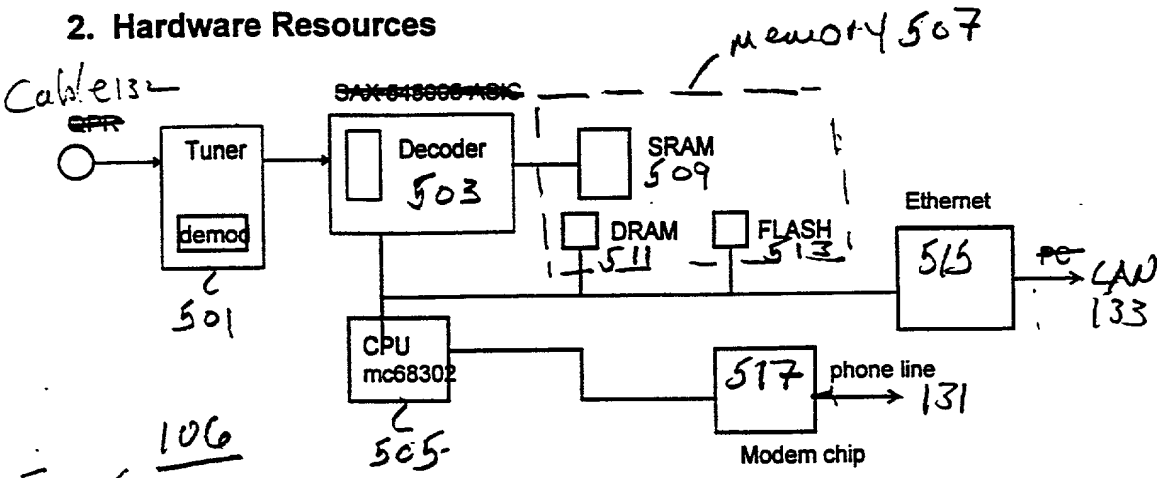
Fig 11

1. Introduction

This document describes the software characteristics of the cable modem used in Scientific Atlanta's *Cable Data Network Architecture*. The cable modem will provide asymmetrical transport using Quadrature Partial Response modulation downstream with upstream data provided by an integral telco-based modem. The connection to the host PC is provided by an Ethernet interface. Since the modem contains a telco modem, an additional mode of operation is as a standard AT command set modem when used with a Scientific Atlanta supplied device driver.

This modem will capitalize on several existing technologies already developed at Scientific Atlanta, most notably Digital Music Express (DMX), and SEGA product lines. In order to hasten the deployment of the modem, an operating system is being purchased from Microtec Research.

2. Hardware Resources



106

Fig. 5

The Scientific Atlanta Cable Modem has several key hardware components that the software will accommodate. The three outside interfaces to the cable modem are the QPR/cable-TV coax, the ethernet port going out to the user network (probably a user PC), and the telephone company modem.

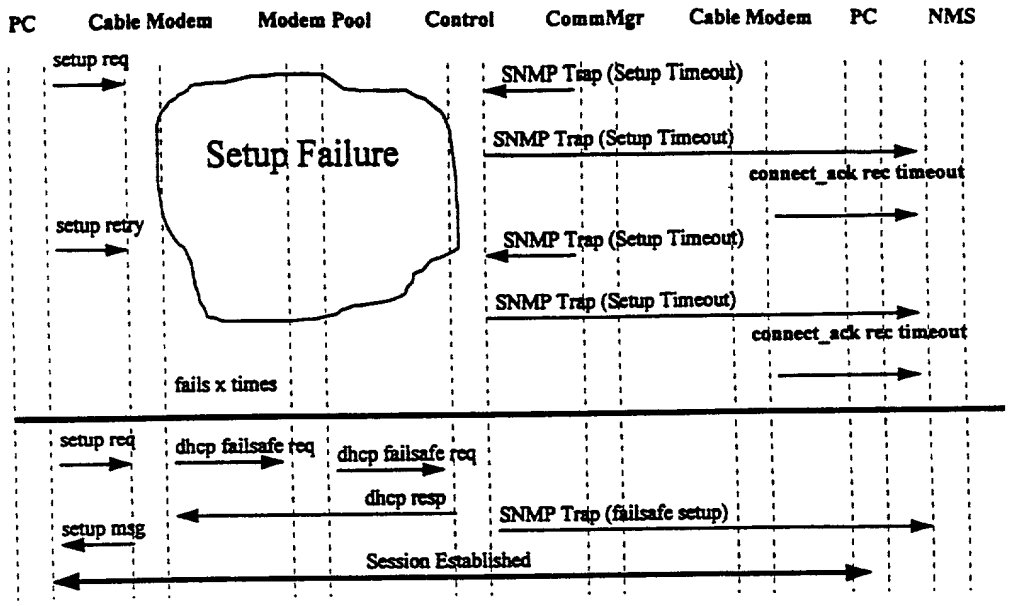
In order to support the three interfaces, there are a number of support components. On the cable /RF side of the box there is a tuner/demodulator which has been previously developed by SA for use in the SEGA project. This tuner/demodulator takes a QPR signal which arrives over a coaxial cable from the cable head end and produces a usable digital stream. This digital stream is passed to the SAX 545005 ASIC which digitally decodes the stream, which includes de-interleaving on multiple levels and decoding the BCH error correction encoding. For more information on how the SAX chip works, see the SA internal documentation titled "Design Requirements Document for the Sega ASIC for 32X-Cost Reduction (SAX-CR)".

In addition to the SAX chip the cable modem motherboard is equipped with a MC68302 general processor, which is connected to most of the other major components via a board level bus. This CPU will be running a real-time operating system called VRTX from Microtec Research. The CPU


Host ID 613
Network ID 605
MSB 31
0 LSB
TY 603
IP Address 601
MSB 31
0 LSB
Unmasked UID
Masked 611
Subnetwork Mask 609
Network ID 605

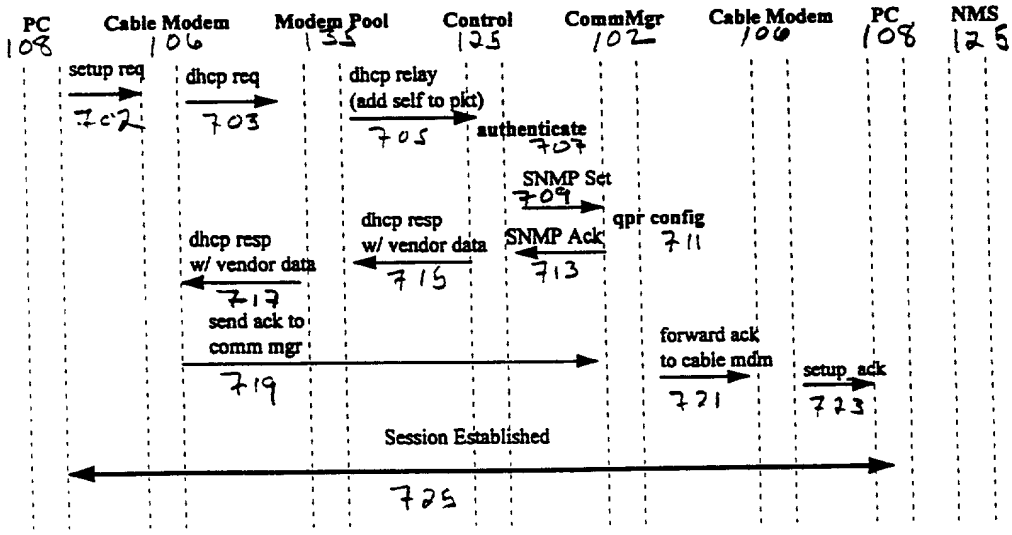
Fig. 6

Figure 11: Scenario D



Setup Request From Authorized Subscriber With Setup Retry Failure, Analog Fallback

~~Figure 12a: Scenario~~ E



701

~~Setup Request From~~ Authorized Subscriber With ~~Successful Setup~~

Fig 7

~~Figure 13. Scenario F~~

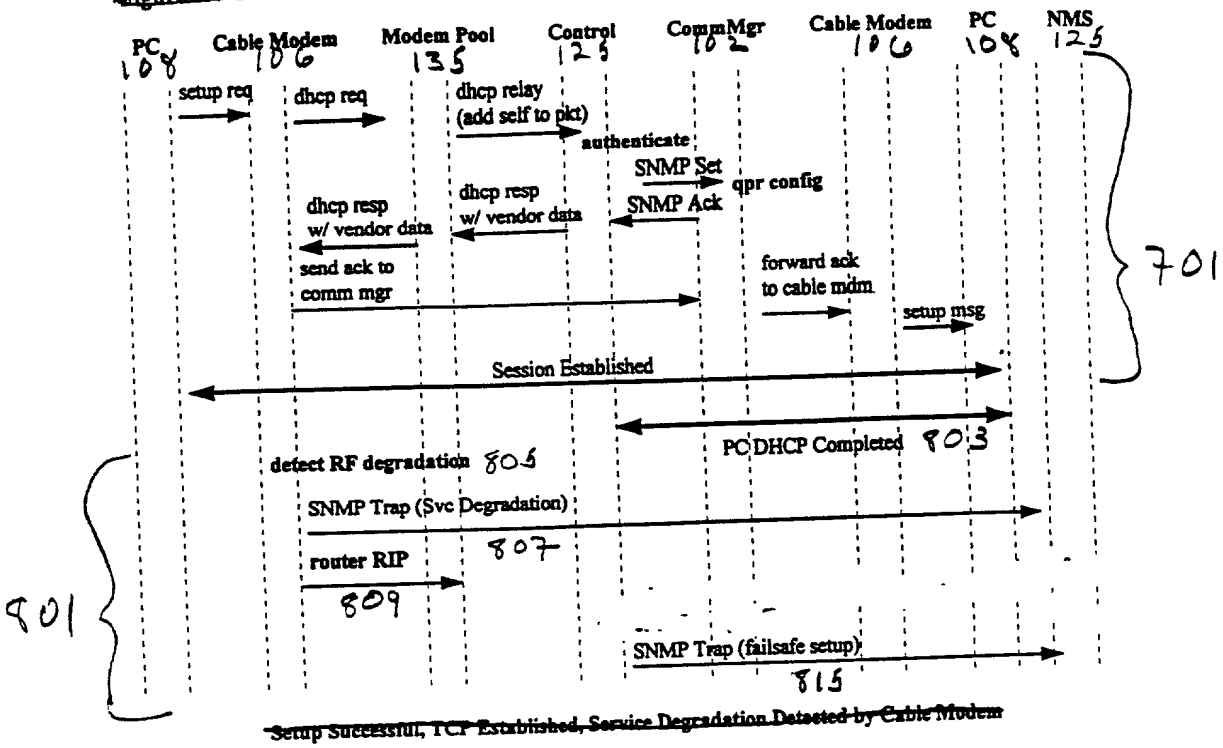


Fig. 8

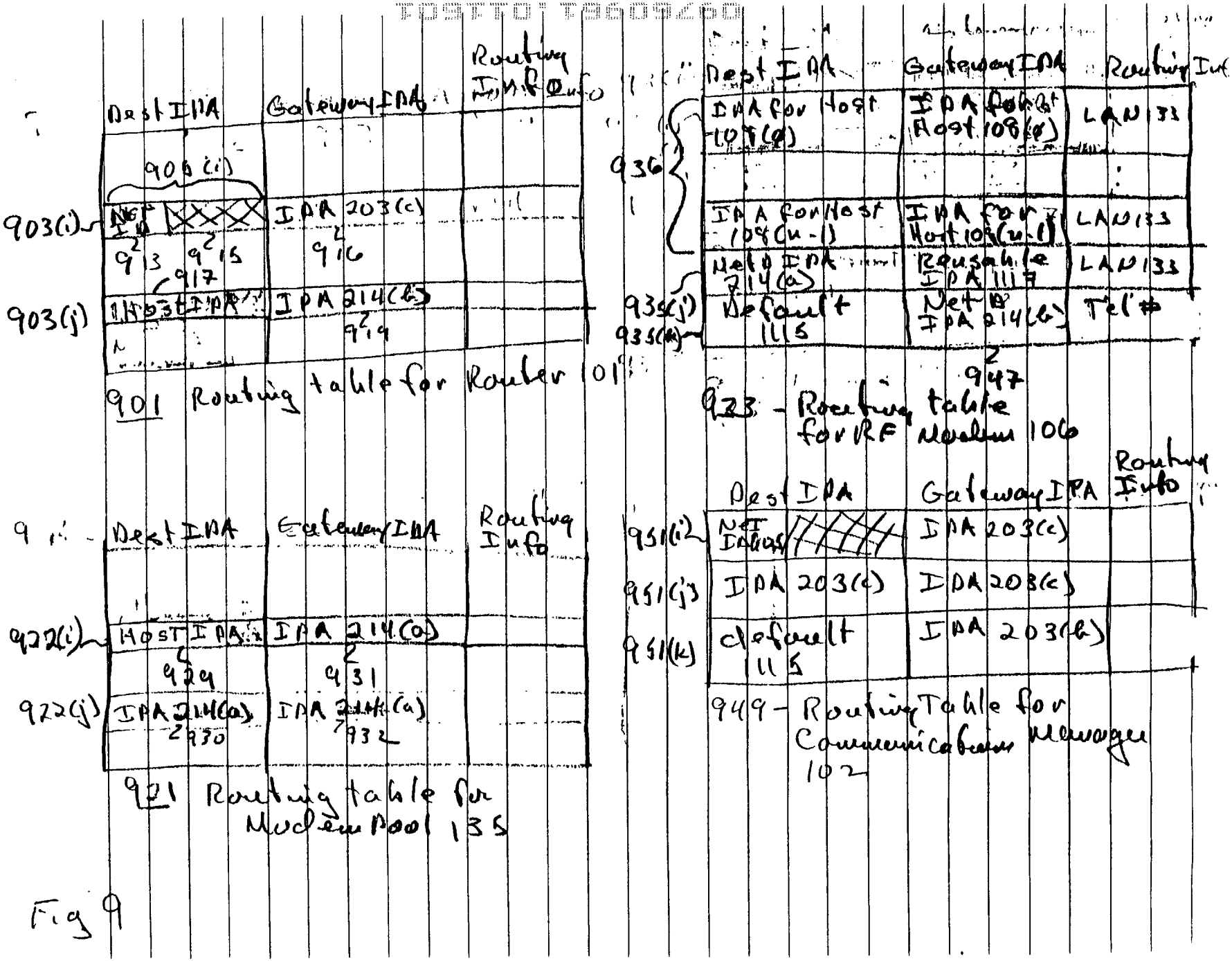
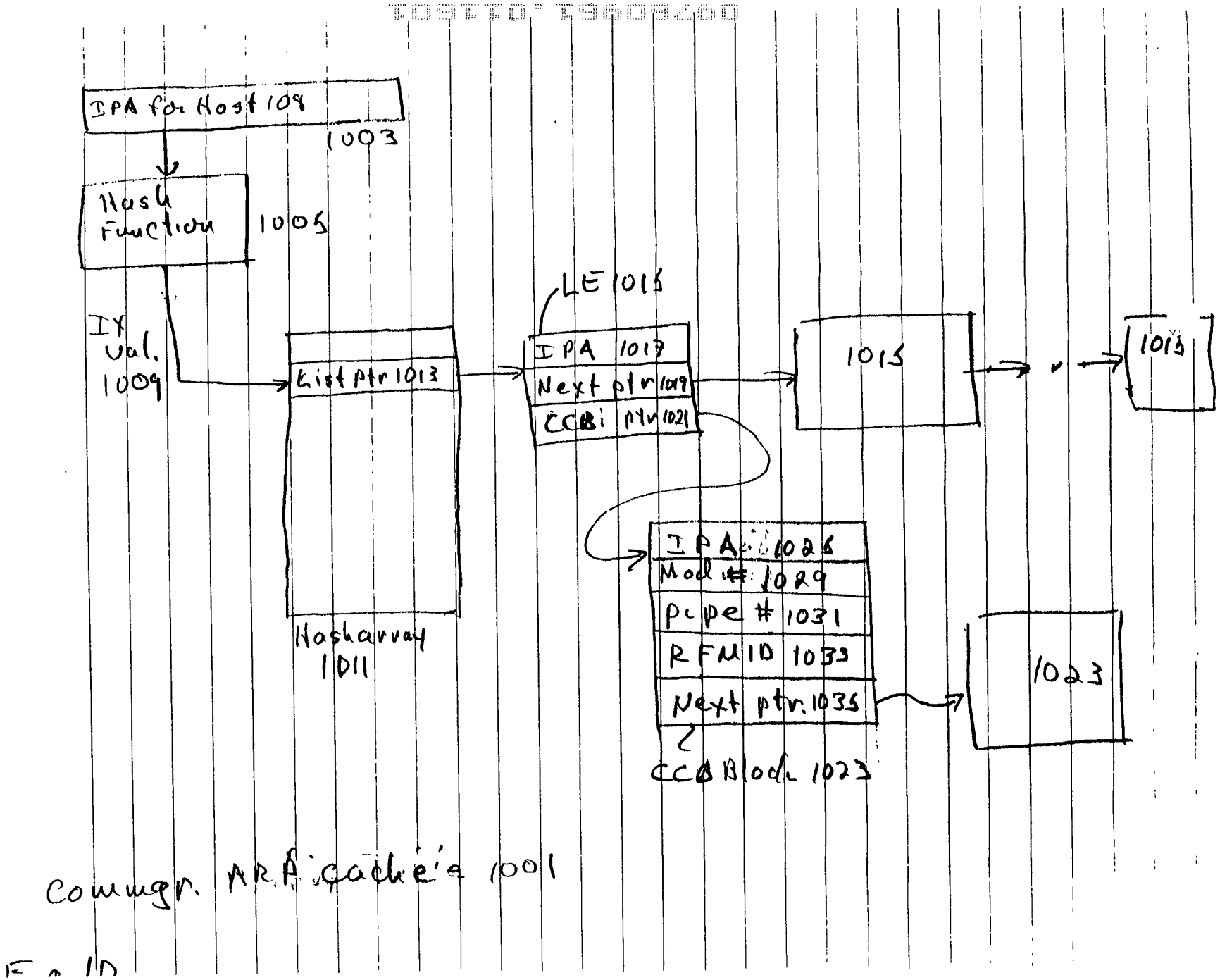

Dest IPA
Gateway IPA
Routing Info
908(i)
903(i)
Net IPA
913
915
917
IPA 203(c)
916
903(j)
Host IPA
IPA 214(c)
919
901 Routing table for Router 101
922(i)
Host IPA
IPA 214(c)
929
931
922(j)
IPA 214(a)
930
IPA 214(a)
932
921 Routing table for Modem Pool 135
936
IPA for Host 108(a)
IPA for Host 108(a)
LAN 133
IPA for Host 108(n-1)
IPA for Host 108(n-1)
LAN 133
Net ID IPA 214(a)
Reusable IPA 111f
LAN 133
935(j)
Default 111s
Net ID IPA 214(c)
Tel #
935(k)
947
923 - Routing table for RF Modem 106
Dest IPA
Gateway IPA
Routing Info
951(i)
Net IDAddr
IPA 203(c)
951(j)
IPA 203(c)
IPA 203(c)
951(k)
default 111s
IPA 203(b)
949 - Routing Table for Communication Manager 102

Fig 9



Comm. ARP cache's 1001

Fig. 10

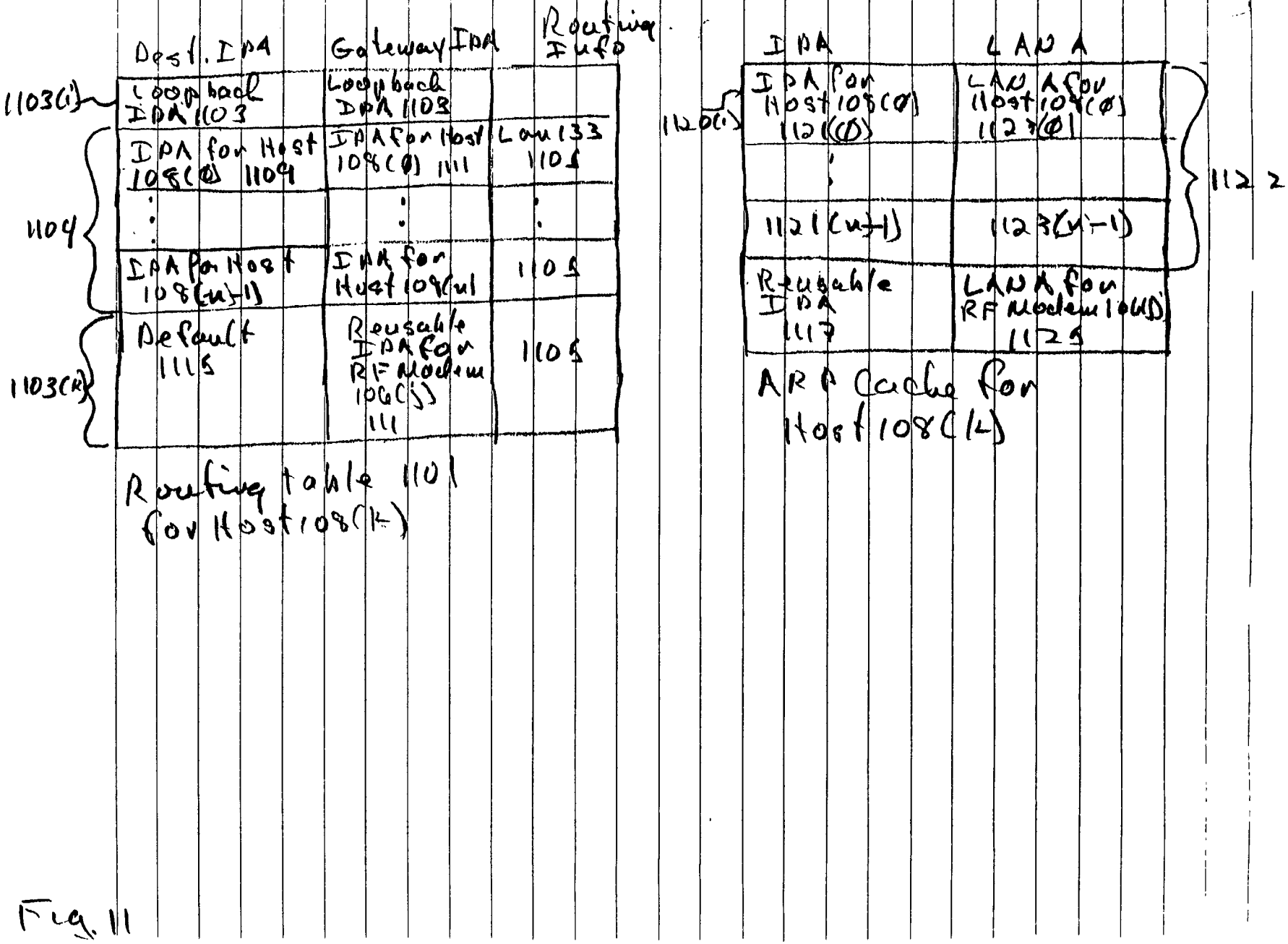

Dest. IPA
Gateway IPA
Routing Info
Loopback IPA 1103
Loopback IPA 1103
1103(1)
IPA for Host 108(0) 1109
IPA for Host 108(0) 1111
Lan 133 1105
1109
IPA For Host 108(u+1)
IPA for Host 108(u)
1105
Default 1115
Reusable IPA for RF Modem 106(S) 1117
1105
1103(R)
Routing table 1101 for Host 108(k)
IPA
LAN A
IPA for Host 108(0) 1120(1)
LAN A for Host 108(0) 1122(1)
1121(u+1)
1123(v+1)
1122
Reusable IPA 1117
LAN A for RF Modem 106(S) 1125
ARP Cache for Host 108(k)

Fig. 11

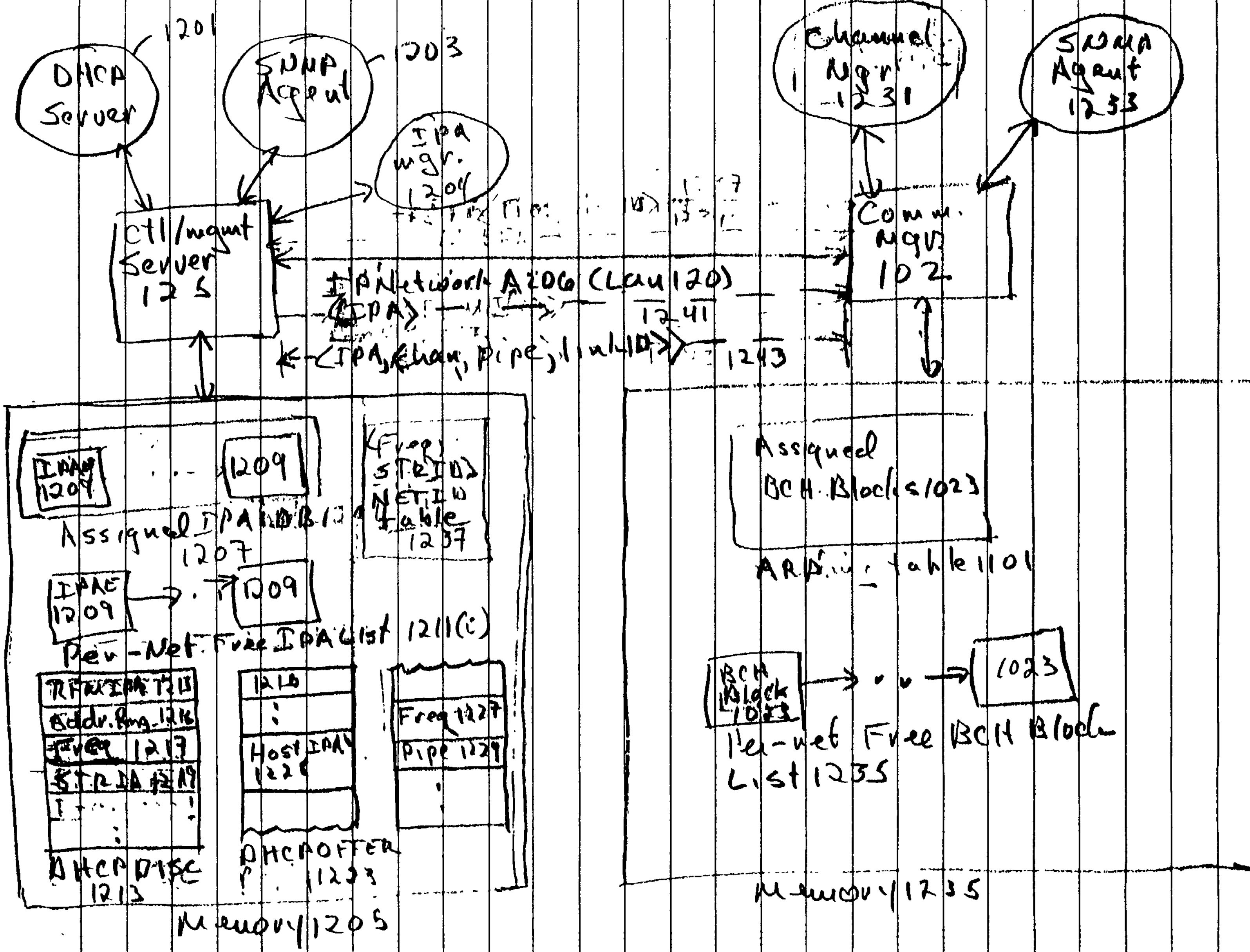

DHCP Server
1201
SNMP Agent
1203
IPA Mgr. 1204
Ctl/mgmt Server 125
Channel Mgr 1231
SNMP Agent 1233
Comm. Mgr 102
IP Network A206 (LAN 120)
1241
1243
Assigned IPA DB
1207
1209
Freq STRID NETID table 1237
Per-Net Free IPA List 1211(c)
DHCP DISC 1213
DHCP OFFER 1223
Memory 1205
Host IPA 1226
Freq 1227
Pipe 1229
Assigned BCH Blocks 1023
ARP table 1101
BCH Block 1023
1023
Per-net Free BCH Block List 1235
Memory 1235

Fig. 12